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TOM: DOES IT SUPPORT THE JOINT WARFIGHTER?

by

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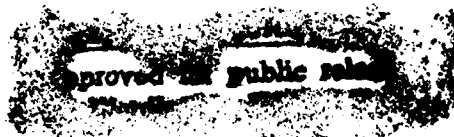
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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of

TQM: DOES IT SUPPORT THE JOINT WARFIGHTER?

The Total Quality Management (TQM) philosophy is now advocated by the Department of Defense and each of its services. Training programs are underway to implement what is essentially a cultural transformation for each service. TQM originally took root in service and support organizations that resource the warfighter, and is now transitioning to tactical units. However, the application of this philosophy for the Joint Force Commander (JFC) at the operational level of war is not addressed.

TQM can enhance the JFC's ability to plan and execute a military campaign. An overview of the Deming TQM philosophy and the separate programs of each service provides a baseline for the JFC. Historical research provides examples and evidence of successful uses of the TQM philosophy. Our modern battlefield will require innovative JFC's who can organize and lead a force using the TQM philosophy. It is recommended that future efforts which offer recommendations on particular techniques for using TQM tools should be documented and published to aid the operational warfighter.

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TABLE OF CONTENTS

CHAPTER		PAGE
ABSTRACT	ii
I	INTRODUCTION	1
II	THE DEMING THEORY FOR TQM	3
	Background	3
	The Fourteen Points	4
	Summary	6
III	BACKGROUND AND PERSPECTIVES	7
	Department of Defense	7
	Department of the Navy	8
	Department of the Army	10
	Department of the Air Force	11
	Summary	12
IV	LESSONS FROM HISTORY	14
	Leadership	14
	Organizational Culture	15
	Organizational Structure	16
	Summary	17
V	TQM AND JOINT WARFIGHTING	18
	Creating the Conditions	18
	Sequencing the Actions	19
	Applying the Resources	20
	Risk Analysis	20
	Summary	21
VI	ARGUMENTS AGAINST TQM	22
VII	CONCLUSION	24

NOTES	27
BIBLIOGRAPHY	30

TQM: DOES IT SUPPORT THE JOINT WARFIGHTER?

CHAPTER I

INTRODUCTION

The "Total Quality Management" (TQM) theory developed by Dr. W. Edwards Deming is now endorsed by the Department of Defense (DOD) and its four military services. The transition to TQM requires an intense cultural transformation and philosophical change within an organization. Because the goal behind this move by DOD is to increase effectiveness and efficiency during a period of dwindling resources, the application to warfighting at the operational level is not yet addressed. The DOD move towards TQM provides a tremendous opportunity for the joint warfighter to enhance his combat capability. In fact, the nature of future warfare given a shift to a "joint, force-projection, regional contingency" paradigm actually dictates that the Joint Force Commander (JFC) employ the tenets and tools of TQM.

The road towards implementation of TQM began with the Office of the Secretary of Defense. In keeping with a tenet of TQM, decentralization guided the mandates to implement the change. Each service embarked on a separate program and plan for adoption. The initial programs of implementation occurred primarily in service and support agencies that closely model civilian corporations. As training programs developed, tactical units also began to adopt the TQM philosophy. Consequently, the published material detailing success stories

paint a picture of a TQM as having only utility for "home base" or "home port" fixed organizations or tactical units.

This paper will provide general information on TQM itself and, the approach both DOD and the different services have taken to implement the TQM philosophy. This is intended to provide the JFC with the background knowledge of the philosophy each service brings to the joint planning and decision making table. It will then examine historical research which outlines how successful combat leaders and organizations have proven that the TQM theory is in fact a valid approach to plan and execute campaigns. Some insights into why the future battlefield will require a TQM approach, and suggestions for application will be offered. Finally, we will examine some counter-arguments to the use of TQM at the operational level. The scope of this research does not specifically address the United States Coast Guard in the review of service programs, nor does it address any DOD agencies which support the operational commander. However, the conclusions reached on the application of TQM at the operational level will allow the JFC to better lead, manage and integrate these organizations into a synchronized campaign plan.

CHAPTER II

THE DEMING THEORY FOR TOM

Background.

Dr. W. Edwards Deming is a 1921 graduate of the University of Wyoming and later received a Ph.D. in physics from Yale University. Dr. Deming's notoriety as a management consultant resulted from his work in Japan during the economic reconstruction following World War II. His book, Out of the Crisis, outlines his philosophy of TQM and proposes specific paths for American businesses to improve their production or services. "Deming has developed a philosophy of quality management that is rooted in an understanding of the power and pervasiveness of variation and how it affects the process, that delicate interaction of people, machines, materials, and the environment."¹

The essence of Deming's philosophy is best summed up in these six key features:

- (1) Top management commitment.
- (2) Input from customer (or internal user).
- (3) Involvement of workers at every level.
- (4) Emphasis on design quality and process improvement.
- (5) Decisions based on information instead of opinion.
- (6) Continuous improvement through reducing variability.²

Demings's first feature clearly recognizes the important role of leadership in a successful organization. The second feature reflects his belief on the importance of listening. The third

feature reflects his idea of empowerment which stands as a major pillar within his philosophy. The fourth feature conveys his belief that TQM is designed to improve a process over time and not serve as a problem solving methodology. The fifth feature focuses on his belief in the use of statistical process control (SPC) empirical data to detect flaws in a process. "Critical to the Deming method is the need to base decisions as much as possible on accurate and timely data, not on wishes or hunches or 'experience'." ³ Finally, the sixth feature is the culmination of the first five in a continuous process of improvement by reducing and refining the flaws in the processes.

Deming's philosophy encourages innovation at all levels as a means to recognize and continuously improve the process and the quality. While the theory may appear to be abstract and statistically oriented, Deming actually focuses heavily on the human dimension of an organization. The role of the leadership in seeking innovation and empowering subordinates to initiate solutions are imperative for success. A work environment which removes fear and blame is then created, and the organization undertakes a cultural transformation.

The Fourteen Points.

To better appreciate Deming's view that TQM is a cultural transformation, we must examine his fourteen points. The points provide the doctrinal basis for this transformation, and apply to any size organization.

*1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.

2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.

4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

6. Institute training on the job.

7. Institute leadership (See Point 12). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

8. Drive out fear, so that everyone may work effectively for the company.

9. Break down barriers between departments. People in research, design, sales, and production must work as a team to foresee problems of production and in use that may be encountered with the product or service.

10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.

b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.

12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.

b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia, abolishment of the annual or merit rating and of management by objective.

13. Institute a vigorous program of education and self-improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job."⁴

Summary.

Dr. Deming outlines a management philosophy which is intended to focus an organization on a long term vision. It seeks to improve quality or service by scientifically identifying variations which hinder a process and degrade quality. His philosophy forces the organization to look at continuous improvement to achieve its objectives and to place an enormous effort on leadership and empowerment. We will now look at how the DOD and each service embraces this philosophy to develop their own criteria definitions of quality organizations.

CHAPTER III

BACKGROUND AND PERSPECTIVES

Department of Defense.

The emergence of the total quality concept within the federal government began during the Reagan administration. Executive Order 12552 in February 1986 established the "Product Improvement Program for the Federal Government" with published objectives of a 20 percent productivity improvement within each department. In February 1987, Secretary of Defense Weinberger adopted the philosophy for DOD in an attempt to weed out barriers between organizations. The TQM program really took root in 1988 when Secretary of Defense Carlucci issued his "Department of Defense Posture on Quality." In this document he adopts the TQM philosophy as the vehicle to reduce costs and improve quality with a declining budget. "We need now to expand the TQM effort throughout DOD. The ultimate goal is the satisfied, quality-equipped, quality-supported soldier, sailor, airman, and Marine."¹

Secretary Carlucci's memo lead to the development of further publications within DOD. In August 1988 the Total Quality Management Master Plan was published for DOD which outlined long, mid, and short-range goals for implementation. The following year DOD Directive 5000.5L-G, TQM - A Guide For Implementation enhanced the Master Plan. A key point of this publication is the seven step model for continuous improvements:

1. Establish the management and cultural environment.

2. Define the mission.
3. Set performance and improvement goals.
4. Establish improvement projects and action plans.
5. Implement projects with performance tools.
6. Evaluate the improvement effort and identify areas for future improvement efforts.
7. Review the progress made and then begin the process all over again.²

The intent of the DOD plan to implement TQM clearly focused on resourcing the warfighter. With the groundwork established, DOD agencies responsible for supplying and supporting the services began to implement TQM. The seven step model however, can be applied to operational warfighting and we will revisit the application in Chapter V.

The TQM wave within DOD did not end with the publications in 1988 and 1989. As recent as January 1993, the top management of Pentagon continues to practice TQM. The New York Times reported on 10 January that approximately 60 Pentagon officials under the leadership of Deputy Defense Secretary William J. Perry met in Maryland to discuss systematic problems affecting financial management, acquisition, and readiness.³

Department of the Navy (DON).

Implementing the quality approach within DON started in 1987 when the Secretary of the Navy, (SECNAV) the Chief of Naval Operations, (CNO) and the Commandant of the Marine Corps, (CMC) jointly signed the Department of the Navy Productivity Improvement Guiding Principles. The adoption of the TQM model for this approach became

institutionalized in 1988 when Under Secretary of the Navy (UNSECNAV) Garrett specified that TQM would be implemented at all levels of the Navy and Marine Corps.

Similar to the DOD objectives, the early DON program focused on reducing costs in the supply and services arena. Strategies outlined improvement goals for shipyards, aviation depots, weapons systems maintenance activities, public works centers, and Marine Corps supporting establishments. In contrast to DOD however, the DON recognized that TQL applied to combat units as well.

"While TQL principles and related methods are applicable to all systems; we recognized that operational requirements aboard ship, and combat command environments involve systems that are different from shore support activities. The application of TQL in the fleet must address these differences."⁴

The fact that the Navy titled its formal program as "Total Quality Leadership," (TQL), vice TQM reflects an orientation geared to both support functions and warfighting.

"Because of the unique role of leadership in military operational commands, . . . Total Quality Leadership has been chosen as the title for quality principles, approach, and methods that will be used throughout the Department of the Navy."⁵

In August 1990 the CNO published his own 14 points of TQL which are based on Dr. Deming's 14 points outlined in Chapter II. The DON also institutionalized the organizational elements necessary for the TQM process by establishing an Executive Level Steering

Committee (ESC) and directing all levels to establish Quality Management Boards (QMB) and Process Action Teams (PAT).

Implementation of TQL within the DON has been accelerated by interest and efforts of both the CNO and the CMC. Recognizing the evolution of "jointness" as well as declining resources, both logistics organizations and combatant commands have embarked on the process. In a videotaped question and answer session on TQL, General Boomer, Admiral Mauz, and Vice Admiral Robinson detailed stories of reorganized staffs, more efficient depots, and newly commissioned ships that have successfully implemented TQL.⁶

Within the Navy philosophy there is a heavy emphasis on both statistical process control (SPC) and leadership as a means and ways to implement TQL. The DON is truly approaching TQL as a total transformation and cultural change.

Department of the Army.

The Army did not embrace TQM as rapidly as the Navy. "In November 1988, the Secretary of the Army and the Chief of Staff of the Army issued a joint message -- 'TQM is a tool which must become an integrated part of every functional activity at all levels, in every organization, government, and industry.'"⁷ It was not until 1992, however, that the Army revised Army Regulation 5-1 which establishes "Total Army Quality (TAQ)" as the Army's management philosophy.

TAQ is not an optional program within the Army. A separate TAQ publication outlines the formal implementation plan consisting of four phases: (1) Awareness; (2) Assessment; (3) Team Building; and (4) Action.⁸ The approach is decentralized with a heavy emphasis on leadership. The TAQ philosophy mirrors Dr. Deming and establishes a process for continuous improvement through the "plan-do-check-act" model. It also establishes the organizational structure of ESC, QMB, and PAT's. Similar to TQL, TAQ is a radical change. "The intent is to develop and institutionalize an organizational culture which ensures every soldier and Army civilian has the opportunity to effectively participate and contribute to the Army's continued success."⁹

The TAQ publication highlights success stories in service and support sectors, but the message from the Chief is that TAQ applies to all organizations. The new AR 5-1 is intended to reinforce leadership manuals and doctrine so ". . . they are also complementary to the long-standing principles of war and our fundamental military leadership."¹⁰

Department of the Air Force.

The Air Force followed the 1988 SECDEF memo with a formal endorsement by the Secretary of the Air Force (SECAF) and Chief of Staff of the Air Force, (CSAF), on 26 May 1988. Great strides were made in the past two years to fully implement the TQM philosophy. "Quality Air Force (QAF)", is the formal program and it ". . . is an integrated system of

three components built on leadership. Quality Focus, the Improvement Process, and Quality in Daily Operations are the system elements."¹¹

In 1991 the CSAF established the Air Force Quality Council to provide policy and strategic direction to the program. The Air Force Quality Center was also established at Maxwell AFB to help implement the philosophy.

The "Quality Air Force" philosophy is also deeply rooted in Dr. Deming's teachings. It emphasizes SPC as tools to study and engage in process improvement. Since the DOD, the Air Force uses a seven step model and the "plan-do-study-act" cycle for continuous process improvement. The Air Force also links the cultural change to QAF with its new doctrine of "Global Power and Reach" as a means to targeting breakthroughs in critical areas through innovation and increased performance.¹²

In October 1993, the Air Force held its first QAF Symposium in Montgomery, Alabama. An 805 page book produced for the symposium outlines the many instances where QAF has been instituted in Air Force support elements and tactical organizations.

Summary.

In the past five years, TQM progressed from a SECDEF memo to a cultural movement throughout the services. This brief overview of each service indicates that they are all essentially moving in the same direction. The various forms of TQM are institutionalized in training, emphasize leadership and empowerment, rely on SPC, and focus

on a continuous process improvement. During the initial stages of implementation, the service and support community seemed to provide the greatest number of laboratories for change. Recently however, the tactical units are beginning to implement this philosophy that was originally intended to improve quality and cut costs. With the advent of this cultural change, it is imperative to look at the application of this philosophy to the JFC at the operational level.

CHAPTER IV

LESSONS FROM HISTORY

History teaches us that effective combat organizations were led and organized unknowingly on the now called "TQM philosophy." In this chapter we will examine previous research which will provide a good outline of the type of leadership, organizational structure, and organizational culture which has succeeded in combat.

Leadership.

Both Dr. Deming and each service recognizes up front the role of leadership to a quality organization. While TQM is a management philosophy and not a leadership quality, if it has any application to warfighting it should be a model which complements the leadership style of the executive.

An analytical study entitled Leadership In War and In Peace: A Historical Assessment For Today provides valuable insight. The paper analyzed the leadership qualities of Generals George S. Patton Jr., Dwight D. Eisenhower, George S. Brown, Curtis E. Lemay and Admiral Chester W. Nimitz. "All demonstrated qualities in peacetime that contributed to their success later on in wartime . . . The study clearly shows that their ability to maintain focus on the right issues and to maximizing subordinates' capabilities were major contributors to this success."¹ The study also details common attributes which supported the qualities.

"The two most common attributes these top leaders demonstrated (in one form or another) were (1) the ability to identify the limited number of critical factors needed to achieve an objective and to maintain focus on the these and; (2) concern for subordinates."²

Although this referenced study never addresses TQM, it is clear that the qualities and traits of these leaders directly parallels the tenets of TQM. A leader who expects to be successful in combat should employ some form of TQM. An organization already indoctrinated to TQM will improve the leader's ability to orchestrate a Joint force campaign plan.

Organizational Culture.

Mr. Faris R. Kirkland of the Army War College conducted a study of three military campaigns comparing the effectiveness of military forces with opposite combat leadership styles: empowerment versus authoritarianism. The focus of his study centered on the leadership at all levels, which in essence is what I term their "organizational culture." The three campaigns and forces he examined were the German invasion of France in 1940, the Japanese seizure of British Malaya and Singapore in 1942, and the Chinese intervention against American forces in Korea in 1950. The Germans, Japanese, and Chinese forces were each inferior in numbers, but the leadership fostered a culture which empowered subordinates. Obedience was paramount, but the strict discipline did not create 'fear in the

workplace.' The commander's intent was clearly articulated and discretion to act was encouraged.

"The leaders of the victorious forces had the vision to recognize that the dispersed nature of the battlefield made it impossible to control directly the action of small-unit leaders, and they had the courage to entrust them with discretion to execute parts of operations. The losers clung to the familiar authoritarian patterns."³

Once again history is a valuable teacher for documenting the effectiveness of a TQM philosophy. Without sacrificing obedience, these forces were able to succeed on their "modern battlefield" by using the tenets of TQM.

Organizational Structure.

In his book Command In War, Martin Van Creveld examined twenty-five centuries of warfare in light of the command structures used as technology and warfare changed. In general, his research determined that victorious forces had five common characteristics:

- (a) Decision thresholds were at the lowest level;
- (b) Self-contained units existed at a fairly low level;
- (c) Information exchange flowed freely between top and bottom;
- (d) Top headquarters searched for information not routinely received; and
- (e) Informal and formal communications networks existed in organizations.⁴

These five points also match the structure of an organization that employs TQM and its tools. While technology can enhance the warfighter, it appears that the correct management philosophy is also required to correctly exploit advantages.

Summary.

A historical look at warfighting organizations from both a leadership and a management perspective clearly shows that TQM can enhance the operational commander's ability to fight. TQM favors the leadership traits necessary to win. It instills a cultural bias which relies on empowerment without sacrificing discipline. And it creates an organizational structure which freely exchanges information across functional areas.

With an understanding of the TQM philosophy, the state of TQM in our forces, and the lessons from history, it is now time to examine how the JFC can apply TQM at the operational level.

CHAPTER V

TQM AND JOINT WARFIGHTING

The JFC who adopts TQM will enhance his warfighting ability during the transition from peacetime to wartime. With the rank and file of the services predisposed to the TQM philosophy, the creation of an ad-hoc Joint Task Force (JTF), or the activation of a standing JTF will proceed smoothly if the leadership and management style remain philosophically constant. The present Joint Military Education system and the services' TQM training initiatives provide a solid foundation to use the TQM tools at the operational level.

Creating the Conditions.

TQM emphasizes developing long-term strategies. The JFC should treat his higher commander as the customer. His vision should look at meeting the objectives provided by the customer, and beyond. A true long-term vision will examine all aspects of post conflict operations and ensure that the peace will be won with an effective exit strategy.

Campaign plans supporting Operations Other Than War (OOTW), are by nature usually long-term affairs. The "plan-do-study-act" cycle of TQM forces the JFC to continually reassess his strategic vision and make improvements. This tool can be effective for OOTW and conventional operations. It precludes the JFC from mistakenly fighting the last war.

Only after completing a thorough development of his strategy for his campaign can the commander communicate his intent. This part of TQM process ensures that his customer's objectives are met, and that his subordinates (or internal customers) can effectively plan to create the conditions in the operational area.

Sequencing the Actions.

Current joint doctrine uses adaptive planning to develop the sequence of events for campaign plans. An organization oriented on TQM will be better able to conduct adaptive planning. Staff officers and commanders who are attuned to "thinking outside the box" are more likely to craft innovative plans. An organization that is structured to communicate across functional areas will better synergize the combat, service, and support actions necessary for victory. "The new paradigm suggests that simultaneity or what some theorists call simultaneous or parallel warfare (as opposed to serial warfare) is key to future operations."¹

The use of SPC may also lead to revelations about historical flaws in past processes or campaigns. A work by Barry M. Blechmen entitled "Global Power Projection - The U.S. Approach" is an excellent use of SPC to determine the effects of several Flexible Deterrent Options.

Applying the Resources.

The application of joint forces on the modern battlefield will require organizations predisposed to integration across functional areas. The TQM model of the ESC, QMB, and PAT's can enhance this process within the JTF. Use of this model will help the JFC gain leverage during the campaign as operational fires, operational sustainment, and command and control are synergized with combat operations. "This includes the vertical integration of functions with each operating area and the horizontal integration of the functions across operating systems in time and space to maximize a unified effort."²

Risk Analysis.

As General Boomer stated during a TQM panel discussion, "You must take risk to succeed in combat, and if we don't we will fail."³ An organization built on the TQM philosophy may not be more predisposed to take risk, but it will be more inclined to properly analyze risk. The empowerment provided by the TQM philosophy allows leaders at the lowest level to confidently assess a plan and provide genuine feedback on risk analysis or recommended changes to reduce risk.

The military strategy of force projection is inherently risky, and an organization prone to empowering its leaders is needed.

"Leadership at all echelons must empower subordinates to succeed. The requirements of force projection place forces at risk over long distances separated in time and space. Modern communication systems

can easily span these gaps, but stronger means exist . . . leaders at all levels who understand the commander's intent."⁴

Summary.

TQM applications are found across the spectrum of the operational art. The TQM tools are a means by which this science can enhance the art. Joint organizations using the TQM model will transition from peace to war quickly and provide the JFC a combat multiplier as he plans, executes, and revises joint campaign plans.

CHAPTER VI

ARGUMENTS AGAINST TOM

"TQM is not appropriate on the battlefield. The point of TQM is not to manage the conduct of war; it is to improve the way we prepare for it."¹ This view was expressed by the Under Secretary of the Navy Mr. J. Daniel Howard in June 1992. Arguments do exist to support this claim, but *I believe the lessons of history and the applications at the operational level of war demonstrate that TQM does support the warfighter.*

The TQM philosophy requires stability in an organization to allow sound management. The operational and warfighting organizations are inherently unstable. Task organization, turnover, and casualties are but three ingredients in war that inherently cause organizations to lose stability. However, entire services that are culturally oriented to TQM can quickly adapt. An organization with the command climate created by TQM can better deal with the *risk and turbulence of war.*

A second problem area is that of consensus. TQM organizations rely on consensus as a means of developing strategies and solutions. Military organizations in war operate against time and other constraints which preclude consensus. TQM need not hinder discipline or the decision making process. "In combat, the commanding officer alone will decide when to fire. But improved processes . . . will give commanding officers an even greater degree of confidence in those decisions."² An organization which practices TQM can arrive at

consensus without full agreement because the improvement cycle is continuous, and solutions are refined.

A final argument against TQM in the war-fighting environment could focus on the reliance of SPC. Statistical data in the boardroom equates to intelligence on the battlefield. A corporation uses statistics to make decisions based on predictions, productivity, profit, costs etc. The JFC uses intelligence to make decisions based on enemy capabilities and intentions. The intelligence picture may never be complete, but statistical based decision making can allow the JFC to predict the effectiveness of enemy systems or the probability of enemy intentions.

Statistical based decision making is not exclusive of the operational art. The SPC tool combined with the operational art tool of the "coup de 'oeil" allows the JFC to enter the decision making cycle of the enemy commander. Analysis of intelligence trends within the time allotted can produce sound decisions that reduce risk. An organization that routinely employs SPC to determine variation in a process is more inclined to implement the lessons learned and avoid fighting the wrong war.

CHAPTER VII

CONCLUSION

TQM is a powerful tool readily available to the JFC. The TQM philosophy is based on sound logic. The services' TQM implementation programs provide the JFC with educated and trained human resources which are interoperable in management techniques and philosophy. History provides lessons replete with leaders and organizations which have successfully employed TQM to win joint campaigns. The models, steps, and tools used in TQM also enhance the warfighting ability of the operational commander. In fact, the joint doctrine today virtually requires TQM to successfully prosecute force-projection operations.

TQM improves the JFC's ability to plan a campaign. Planning elements organized across functional areas can develop synergistic plans that optimize relative combat power at the decisive point. The planners can minimize risk by analyzing the enemy's decision making cycle and predicting intentions or capabilities.

TQM also improves the JFC's ability to execute a campaign. His commander's intent is a vision of the ideal end state. As the fog and friction of war multiply, assumptions and reality change. The "plan-do-act" cycle provides a model for continuously evaluating the campaign plan in light of the strategic objective. The continuity of the process also reduces the decision making time because variation is reduced as the process is refined. Forces

executing combat operations are empowered to adapt the tempo to the reality of the battlefield as they attempt to achieve the commander's intent.

Integrating TQM into the warfighting arena should start with training activities. The philosophy shared by all the services provides joint interoperability in the areas of leadership and management. Training the warfighter to use TQM can best be accomplished concurrently with JPME Phase I or Phase II schooling. This method will allow officers to use warfighting scenarios to employ the TQM tools.

Each service must also institutionalize TQM training. Training programs should be implemented by functional community to provide a common language for both the leadership and the troops. Implementation by functional area will reduce the risk of the TQM philosophy falling to the side as personnel rotate.

Unified commands can apply TQM at the operational level now. Future research and writing should continue to document practical applications within unified commands and JTF's. Formal after-action reports submitted to JCS should make special mention of TQM tools which have improved the joint warfighting process. Campaign planners using the deliberate planning process should employ TQM. They should document the results of how operational plans improve or document any of Deming's 14 points that will not work at the operational level.

The TQM transition will not be complete until the philosophy is carried to the joint arena at the operational level. This arena is the crux of our warfighting establishment and TQM can enhance this arena.

"So long as command systems remain imperfect -- and imperfect they must remain until there is nothing left to command -- both ways of coping with uncertainty will remain open to commanders at all levels. If twenty-five centuries of historical experience are any guide, the second way will be superior to the first."¹

NOTES

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